

One of the main points of interest in this case, especially after the operative findings, was the absence of mastoid tenderness. This was difficult to understand in a bone so extensively involved and especially with a cortical perforation.

The symptoms of mastoiditis are divided into general and local.

**General:** Elevation of temperature, headache, loss of appetite, etc.

**Local:** 1. Pain referred to the mastoid, sometimes radiating down the neck and to the ear.

2. Tenderness over the mastoid region.

3. Redness or edematous swelling.

4. Sagging of the posterior superior canal wall. Narrowing and congestion of the membranous canal.

5. Discharge from the middle ear.

6. Marked deafness.

7. Dullness on percussion is considered of importance by some.

Symptoms of cerebral irritation are considered as complications and will not be discussed; but occurring during the course of the infection, they are a strong indication for immediate operation.

Radiography of the mastoid has been advocated. While this may be of value in the chronic suppurations of the middle ear, it seems of no value in the acute infections, since it is not so much to determine if the mastoid process is involved as it is to decide whether or not the infection will subside without operative interference.

The increase in the polynuclear leukocytes is important when present. However, this is more frequently absent than otherwise. The importance of the specific micro-organism has been the occasion of much discussion, the streptococcus, pneumococcus, pneumo-bacillus and straphylococcus pyogenes being most important, or most frequently found. The streptococcus is probably the most virulent. The streptococcus capsulatus has been found to be quite insidious in its invasion and progress. The pneumococcus seems to be very rapid in its invasion, giving rise to acute symptoms: the mastoid tenderness is general and pain severe; the early discharge sero-sanguinous and profuse; yet this is a type of mastoiditis which very frequently subsides without operative interference.

The infective micro-organism is only one factor in the weighing of symptoms, yet frequently it is the deciding element which tips the scales.

Pain in the mastoid region is variable, frequently decreasing and at times disappearing in a progressive mastoiditis. Its importance is dependent on one's ability to eliminate the neuralgic element which is so often found in the course of a gripe infection.

**Tenderness:** This symptom is probably the most generally depended upon in determining an operative necessity, yet its importance is variable—as shown in one of the cases reported—with a great amount of bone destruction there was no mastoid tenderness, and there are numerous cases of this type. On the contrary, in a case recently seen, the mastoid tenderness was very acute and general, persisting for four days; but from this time on becoming less marked, with a subsidence of the

other symptoms; complete recovery occurring in about seven days.

Redness with edematous swelling over the mastoid is usually a late symptom of the disease and demands prompt surgical attention.

Sagging of the posterior superior canal wall seems to be generally considered an absolute indication for operation. Unfortunately, though, it is frequently not advisable to wait for the appearance of this very important symptom.

Quantity and character of the aural discharge is a most valuable symptom; especially is this true of the discharge as it escapes from the perforation in the membrana tympani. A similar symptom is emphasized by Politzer; i. e., the pulsation of the discharge coming from the perforation. He believes if this symptom continues for two weeks, an operation is indicated.

Unfortunately, it is impossible to arrange a group of pathognomic symptoms for every case of mastoiditis; however, there are in the great majority of cases a sufficient number present to enable us to decide upon the proper procedure.

There are some specialists who seem quite radical in that they advocate an operation on practically every case of mastoiditis in which tenderness persists for three days; but this is only one of a group of symptoms, and its importance varies. There are others, so-called conservatives, who wait for symptoms which indicate an extension of the infection beyond the mastoid process, or until the bone is thoroughly broken down. This procedure not only endangers the patient's life, but jeopardizes a successful outcome of the operation.

The true conservative attitude is the intermediate; namely: in those cases where the patient is seen early in the disease it seems advisable to wait a reasonable number of days, even with a persistence of mastoid tenderness, provided the patient's general condition remains good. There is more occasion for prompt surgical attention in those cases seen after the middle ear infection has persisted for some days.

#### RATIONAL SURGERY OF RETRO-BULBAR NEOPLASMS, WITH REPORT OF A CASE OF CYLINDROMA OF THE ORBIT, EXTIRPATION OF SAME AND PRESERVATION OF THE EYE.\*

By P. DE OBARRIO, M. D., San Francisco.

For purposes of description and as a guide of diagnostic value, it is well to divide the orbital cavity into four quadrants or sections and bear in mind the bones forming its boundaries as well as the soft structures contained therein.

In a general way, the upper quadrant or vault of the orbit presents a larger space for the growth and expansion of neoplasms; the external quadrant comes next as to capacity, then the inferior and finally the internal. The nine openings of the orbital pyramid serve as gateways or passages for the transmission of motor, sensory and trophic

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nerves, arteries, veins, lymphatics, etc., to and from the eye and beyond the orbit and its contents to other portions of the face and accessory cavities.

The orbital contents are of such a variety that there are but few tissues not represented, hence it is proper to expect and it actually occurs that every variety of neoplasm has been found and described, both malignant and benign, some relatively frequent, others extremely rare.

From the standpoint of embryology we should expect this also to be true as in fact the orbit and orbital contents develop from the epiblast and mesoblast and all tumors both malignant and benign are the offspring of these embryologic strata, excepting the non-malignant adenomata and the malignant columnar-celled carcinomata which are of the hypoblastic epithelial variety.

Roughly speaking, the field that occupies our attention comprises then a rigid conical-shaped bony container formed by seven cranial bones, lined by a contentious periosteum pierced by nine foramina or channels and lodging the lachrymal gland and adnexa, the ocular muscles, orbital fat and cellular tissues, arteries, veins, nerves, lymphatics, a nerve of special sense and the eye proper which is a world in itself. All of these anatomical structures may and do give rise to neoplasms. In addition we have the metastases from other growths elsewhere, as well as invasions from adjacent cavities. It is easy then to foresee the great variety of simple tumors as well as the perplexing number of compound neoplasms that you may have to take into consideration in attempting a diagnosis. The intricacies of the problem are forcibly brought to one's mind after one has made one or more efforts at diagnosis with its attending surprises, or witnessed the brilliant failures of those with unlimited material and experience at their command. I will abstain then from attempting a specific list of these growths and only mention in a broad general way, that as we have to contend with a rigid container and soft contents, you should likewise expect the presence of hard solid tumors such as osteomata and enchondromata, or semisolid tumors as fibromata, neuromata, lypomata, etc., and liquid or fluid such as angiomata, cysts, etc.

Having thus briefly outlined the possibilities of orbital new-growths, we are to review next the general symptoms that we are to expect from their presence in the orbit.

I catalogue these symptoms as follows:

- 1st. Exophthalmus.
- 2nd. Impaired function.
- 3rd. Presence of visible or palpable tumefaction.

I place the exophthalmus in first place because I do not conceive the existence of a new growth seated at the orbit without the presence of this symptom, although the neoplasm be not visible or palpable or even of small dimensions, for if the orbital contents are increased in size or displaced by its presence, the exophthalmus will always be detected after careful investigation, although at

times it may be a difficult matter requiring the use of the ophthalmometer.

The impaired function will be as regards motility and as regards acuity of vision. Regarding motility, it is a well established general principle that it will be diminished or impaired in the direction of the seat of the growth. As regards acuity of vision, it will be diminished in direct proportion to the volume of the neoplasm as well as in direct ratio as to its location whether its greater bulk is situated posterior to the equator of the eye or not; the symptom being most pronounced the more posterior the situation.

In speaking of the seat of the growth it is well to bear in mind that its location in the orbit will be diametrically opposite to the direction of the



Fig. 1. Aspect of patient before operation.

exophthalmus, and as a logical consequence it is well to divide exophthalmus into the following varieties:

- A.—Vertical, comprising upwards and downwards displacements.
- B.—Horizontal, comprising inwards and outwards displacements.
- C.—Diagonal, comprising four varieties: upwards and inwards, upwards and outwards, downwards and inwards, and downwards and outwards.
- D.—Direct forwards.

Each one of these varieties has a meaning according to the general rule I have laid down above, and by reviewing the anatomical elements that are contained in each of the four quadrants of the orbit, you gather an index as to the possible nature of the new growth.

Following this classification, it is fair to assume for instance, that a forward displacement of the eye with a slight upward and outward deviation is an indication of a tumor of the optic nerve. Likewise, a downward displacement would indicate the presence of a growth at the vault or adjacent tissues; an upward displacement would have a similar significance as regards the lower wall of the orbit. An oblique displacement downwards and inwards would be suggestive of a new growth of the lachrymal gland or adjacent bony wall, whilst a displacement downwards and outwards would be strongly suggestive of frontal sinus involvement in

the shape of an exostosis, for instance; an outward displacement should call your attention to an affection of the ethmoidal sinuses, and a similar reasoning should be properly applied to each one of the varieties I have enumerated above.

I will mention in a passing way, bilateral exophthalmus such as occurs in the exophthalmic goiters, or that consequent on thrombosis of the cavernous sinus; pulsating exophthalmus, and orbital angiomata. Cystic collections must be included, but I omit panophthalmus and such neoplasms as invade the orbit by propagation from within the eye as they are beyond the scope of this work; also emphysema orbitaria or the traumatic hematomata which can not be properly considered.

The means of investigation that we have at our command, in the presence of a given case, are such general and valuable principles as: history, inspection, palpation, percussion, transillumination, focal lighting, fluoroscopy and skiagraphy which should be always employed whenever obtainable as giving information of the greatest value. Another very useful aid is the aspirating needle which should never be forgotten in all such cases in which there is the slightest indication of the presence of fluid, even if after palpation you are impressed with the resistance of the growth, as it happens at times that the liquid is enclosed in a non-elastic container under relatively high pressure. The aid of the ophthalmometer in the doubtful cases of eye protrusion is of such value that it should never be neglected, being an extremely useful and practical procedure.

It is well to follow all these measures in a systematic manner, much in the same way that a physical examination is conducted in any other region of the body in order to ascertain the nature of the case before you or reduce to a minimum your possible failure of diagnosis.

Having arrived now at the question of treatment I will pass in review only such general medical measures as are applicable to gummatous affections, or the electro-therapeutics of the angiomata and of the muscular paralysis which permit of a forward displacement of the eye, and confine myself to surgical interventions proper which is the motive of this work.

In order to use some method in classifying the great number of procedures at our disposal, I will group them into several categories comprising:

- A.—Extirpation through soft parts with preservation of the eye.
- B.—Extirpation through a bony flap with conservation of the eye.
- C.—Extirpation with ocular enucleation.
- D.—Exenteration of the orbit, which may be complete, or subconjunctival or plastic.

Of these four modes of procedure I wish to lay particular stress on the first method, that is to say: the extirpation through soft parts with preservation of the eye, as to my mind, in the greater majority of cases one should be able to obtain satisfactory results without resorting to the more radical methods that I have catalogued above. It is my desire to be very emphatic right here, though,

to avoid any misinterpretation, and make myself perfectly understood, that at no time would I sacrifice thoroughness to conservatism, but I should always be rational on principle, and eventually as radical as the particulars of every individual case would demand.

I am perfectly convinced, and I furthermore maintain, that in order to enter the orbital cavity once it has been invaded by a neoplasm, and at the same time not injure the eye, and furthermore obtain sufficient space for all practical purposes, that the incision of choice should be at about one to two centimeters from the orbital margin and parallel to it, same to be situated at any section of the circumference, at the point of greatest protrusion.

The next indispensable point is a careful and tactful dissection, whereby one should be led to a point of cleavage in all encapsulated tumors and by following same with a blunt instrument you will find extirpation greatly simplified. The following step is the inspection of the seat of the neoplasm by direct vision and digital palpation whenever practicable. A good many cases of alleged recurrences are due to negligence of this detail.



Fig. 2. Aspect of patient thirty days after operation.

I furthermore insist that the value of this method is based on the fact that in all tumors of the soft parts or of the wall, excepting perhaps those arising from the ocular muscles, or from the optic nerve, the expanding impulses of the growing neoplasm gradually, but most effectively, exert their influence in all directions; but as the osseous container is non-yielding, the soft parts will be displaced towards the point of least resistance, or in other words, forwards as well as diametrically opposite to the point of its attachment. As a direct consequence of this expansion the tumor will dissect its way outwards and meet you half way, so to speak, in your effort to extract him. If such a tumor be not of a decided malignant nature and therefore not invading all structures in its vicinity, there should be no reason to employ any other routes than the ones I have described.

Such growths that are located at or forward of the equator of the eye, make their appearance early at the orbital margin and their recognition and removal is rendered relatively easy.

Beyond the equator of the eye, the digital or

visual recognition of these growths is a matter of greater or less difficulty in inverse proportion to their volume.

In all cases of exophthalmus, the optic nerve will be rendered tense, the muscles will be put upon the stretch together with the ciliary nerves, arteries and veins; the orbital fat will be crowded out of the way as well as the lachrymal gland. All these structures coming under the category of soft tissues, are naturally more or less elastic and yielding, principally under the stress of a slow process, and upon this faculty is based the great advantage whereby the eye may be dislocated to an apparently alarming or dangerous degree in order to suit one's needs in the course of a surgical intervention without harmful results.

This faculty of relaxation of the orbital tissues is present to a superlative degree in the rabbit's eye, as it is possible to dislocate same to the extent of placing the lids behind the globe by merely pulling the eye forward without causing the slightest trouble or reaction. This manoeuvre is familiar to all of you who have done any experimental work with these animals.

In entering the orbit through the soft parts, the method of going through the lids only, is adopted by Maisonneuve, Acrel, Halpin and others.

Entering through the conjunctiva without tenotomies but with optical neurectomy, is adopted by Knapp, whilst Rohmer uses the same route but with tenotomies.

The combined method, passing through both the lids and the conjunctiva, is the third way of entering the orbit, and a very satisfactory one according to the nature of the case.

Any one of these methods should be sufficient to accomplish satisfactory results in the great majority of cases.

There are, however, a great number of surgical procedures comprising as a basic principle the formation of a bony flap which I must mention briefly; they involve:

- A.—Resection of the superior orbital wall.
- B.—The inferior.
- C.—The internal.
- D.—The external.

I do not wish to go into the details of these operations for fear of lengthening this paper too much, and because the primary intention is to demonstrate how you may extirpate large neoplasms without their need. I will review them, however, very briefly as a matter of system.

The resections of the superior or of the inferior orbital walls have apparently not had a wide range of usefulness, as little mention is made of them in the literature. As regards the resections of the outer and of the inner walls on the contrary, a considerable number of procedures have been adopted or suggested, all of which may have their place in accordance with the nature of special cases that must be judged on their merits.

The principal operation for the removal of the outer orbital wall is that of Kraunlein, which has been modified in several ways. Another procedure is the removal of the maler bone. One of the

modifications worthy of mention is that of LAGRANGE of Bordeaux, which consists in mobilizing the outer orbital wall with the view of dislocating the eye in that same direction after opening the conjunctiva at the inner angle and approaching the orbit through this angle. It is claimed by the author, and it stands to reason, that it gives a very large space to work in.

There are also several procedures for the exposure of the ethmoidal cells and frontal sinus that incidentally open the orbit in an extensive manner unilaterally or bilaterally, such as the operations of MAURE, of GUSSENBAUER, KILLIAN, etc.

The operations of orbital excenteration and enucleation find their place in such extreme cases as urge such radical procedures.

I have already mentioned to you the method I have adopted, consisting in a semi-circular incision at the orbital margin or better removed one or two centimeters from same, to be located at the seat of greatest tumefaction and comprising in one move all the soft parts down to the bone, as an eminently satisfactory way of reaching the orbital cavity. By this procedure it should be possible to extirpate a great majority of growths without further tenotomies but by careful dissection and by gradual dislocation of the globe.

As an illustration of the foregoing statement I have the honor to present to you a report of a case of large cylindroma of the orbit operated upon by me without tenotomies or bony resection or opening the conjunctiva, and preserving the eye in its entirety with all its functions.

The month of August, 1909, there was admitted at Saint Thomas Hospital in the City of Panama, of which institution I was the Director, a patient of Indian extraction, of dark complexion, about 20 years of age, single, and a laborer by occupation. He was directed to my general surgical ward where I saw him next morning.

History: After a general investigation, I could ascertain no specific history nor hereditary data of any consequence.

The patient claims that three years back he received a piece of coal in the left eye and gives the history of a corneal ulcer which healed after a time. This detail is of importance only because of the fact that at about the same time he noticed that the eye began to protrude from the orbit until it had reached the advanced state that he presented then. The growth had been developing, according to this, about three years.

Examination: The right eye was normal.

The left eye presented a very marked exophthalmus with a decided deviation directly downwards in a vertical plane to the extent of about three-quarters of an inch below the level of the right pupil and a very small outward deviation as well.

The upper lid was very prominent but without any inflammatory symptoms and it had the consistency of a lypoma.

The lower lid, on the contrary, was very much crowded and wrinkled. The palpebral conjunctiva was normal.

The bulbar conjunctiva presented a very marked engorgement of its vessels, principally the veins, due to the compression. There was no loss of sensibility in any part of the organ. The cornea, iris, lense and vitrus, normal. The disc was hazy and presented a very marked vaso-dilatation such as you would expect from compression.

O. D. V. 20/20 Emmetrope.

O. S. V. 20/40 with a very irregular astigmatism from his corneal opacity as well as from the change of form due to the compression. His sight was, however, most affected from his optic nerve compression.

Motility: His eye was practically fixed in the orbit, permitting only very slight motions in every direction except upwards.

Pupillary reaction to light, convergence, and accommodation was very sluggish. Projection and orientation was correct although sluggish.

On palpation, the whole of the tumefaction of the upper lid was of an even consistency very much like the resistance of a lypoma. At the middle of the upper orbital margin, and rather within the orbit, I could feel a very small projection about the size of the tip of the little finger that was very hard and unyielding. This fact, together with the very pronounced exophthalmus led me to believe that the tumor was of rather large dimensions and located principally posterior to the ocular equator. The exophthalmus was not reducible by manual palpation, neither was there any pulsation to be felt.

A tentative diagnosis was made in the direction of a fibroma or an enchondroma, or an osteoma, or perhaps a lypoma or again some mixed benign form as the patient had no pain and at the time, no inflammatory symptoms.

Treatment: Under general anesthesia and previous the routine surgical preparation, I proceeded to make a large curved incision parallel to the orbital margin and a little separated from same, extending from the inner angle to the outer. This incision extended down to the bone. After careful dissection, I located beyond the orbital margin above, a small encapsulated rounded protrusion which I followed with blunt dissection to the very apex of the orbit. I separated it from the muscles, periorbitum and optic nerve, and extracted it in its entirety. As you may imagine by its size, it was necessary to dislocate the eye to an apparently alarming degree. Nevertheless it assumed its normal position. The recovery was uneventful except that upon removing the first dressing in twenty-four hours, I found a considerable edema of the conjunctiva and a somewhat opalescent cornea, which I attributed to faulty circulation through the conjunctival edema, and which cleared up the next day after a few linear scarifications of the conjunctiva.

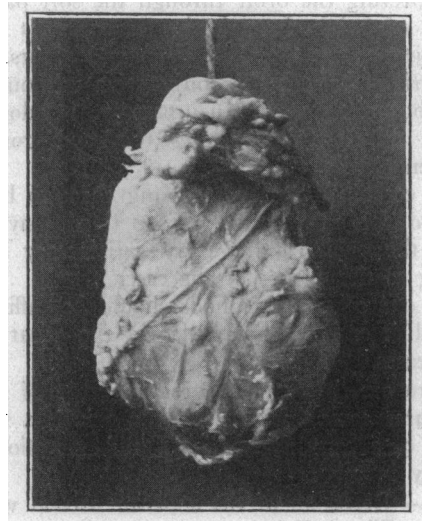
Macroscopy: The photograph shows a roughly oval-shaped encapsulated tumor almost as large as a hen's egg, measuring 5 cm. in length,  $3\frac{1}{2}$  in breadth and  $2\frac{1}{2}$  thick. It lay horizontally from before backwards in the orbital vault with its small end forwards and four-fifths of its bulk posterior to the ocular equator. Through a small rent in the capsule I could detect the contents that appeared like colloid granular material with some very small globules resembling epithelial pearls.

Microscopy: The specimen was hardened in formaline and from a wedge-shaped section down to the center, all microtome sections were made. Generally speaking, the tumor presented evidences of active degenerative evolution. The stroma presented a marked myxomatous degeneration towards the surface, whilst in the center no such change was present. The stroma held together a variety of cells or cell groupings represented by the following types: vesicular cells; cellular nests; atypical vesicles; cellular "pearls" and portions of hyaline or colloid material. The cellular nests are formed by large polyhedral cells somewhat similar to a

squamo-cellular epithelioma. The center of these nests present evidences of a more or less complete colloid or hyaline degeneration which takes readily the eosine stain, and again at times an opal and orange red tint suggestive of keratinization.

The cellular nests and the "pearls" are frequently surrounded by connective tissue and at times by vesicular cells that differ very little in form and size from the nest cells grading off gently towards the stroma cells with which they eventually group by changes of form and stain. The colloid material was to be found also in the center of the atypical vesicles as well as in the nests.

The vesicles were covered by one or more layers of cuboid or flattened cells, which are identical with those of the nests and those forming the greater part of the cellular element of the tumor. With certain frequency these were to be found in the center of colloid material groupings of concentric cells similar to epithelial cells. In one large atypical vesicle was observed a granular coagulated substance with very few red cells but with a considerable amount of desquamated endothelial cells.



Actual size of tumor 5 inches in length,  $3\frac{1}{2}$  inches in breadth and  $2\frac{1}{2}$  thick.

There was only one fully developed blood vessel to be found.

Taking all this into consideration, it is to be observed that there are three well defined elements in this mixed neoplasm that lead to a diagnosis:

- 1—The myxomatous degeneration of the stroma.
- 2—The marked tendency of the cellular element to form cylindrical lymphatic channels which serve as avenues of nutrition.
- 3—Its endothelial origin.

The fact of having these three distinct elements would justify the title of "Myxo-Linfango-Endothelioma" which is a cylindroma.

Through the courtesy of Dr. Darling of the Ancon Laboratory, a few sections were submitted to the consideration of Prof. Welch of Johns Hopkins University who was of the opinion "that this tumor had probably originated in an embryological

nest; that it resembles very much such mixed tumors as are observed in the parotid gland; that the glandular element predominates although there are present epithelial cells and myxomatous degeneration."

The functional examination was perfect with the exception of the vision which was 20/50 as was natural to expect due to the optic nerve condition brought about by the tumor compression. The motility, convergence, etc., and esthetic result I believe is unusually good.

After a lapse of two years there has been no relapse and the good result has been uniformly maintained.

#### Discussion.

Vard H. Hulen, M. D.: I believe the cases of orbital tumors situated posterior to the bulb are very rare, and it is both interesting and instructive to hear such excellent reviews of the subject as that we have just been favored with. In my private practice I have had but one such case in 17 years, and in my opinion this patient would have required a Kroenlein operation. I do not understand Dr. de Obarrio to recommend such an incision as made in his case for all orbital tumors, for I feel sure that a Kroenlein might in some cases be better, in a tumor of the optic nerve for instance. I believe the location and presentation of the growth will very greatly determine the site of the incision. This case that Dr. de Obarrio has so satisfactorily presented to us was an ideal one for the method of removal used, the presentation of the tumor indicated the place for his incision and being encapsulated it was the more easily removed, in spite of its size, by the method chosen than in any other way.

P. de Obarrio, M. D.: It is self-evident that with an incision located at the upper border of the orbit you could not conveniently reach a neoplasm situated at the floor of the orbit, therefore I have insisted very specially in my paper that the curved incision should be at the seat of greatest tumefaction, obtaining in this way a very ready access to the orbit. Dr. Hulen's contention that in such cases where a doubt exists as to the location of the tumor that he thinks it would be necessary to enter the orbit through a bony flap, I may state that I have explained in the course of my paper that any tumor in the orbit will give rise to an exophthalmos no matter how small this tumor may be and that the direction in which this exophthalmos is produced will show by its very nature the location of the tumor. If, however, it should happen that there is any doubt on this question it is a safe procedure to enter the orbit through the external angle, using the same curved incision that I have already described. As to the possibilities of this method of entering into the orbit it seems to me that it has received ample justification by the very nature of the case which it has been my privilege to report to you this evening, as the successful removal of this exceptionally large orbital tumor with such unusual results both functional and cosmetic, I feel certain would not have been possible to obtain through a bony flap, which of necessity would produce more or less deformity. As further evidence of the value of this procedure you will permit me to quote to you Prof. Lagrange's statement in the course of his remarkable work on the subject of orbital tumors, taken from the Proceedings of the French Ophthalmological Society at its twentieth annual meeting. Prof. Lagrange says "... it is at the level of the external angle that one should incise the soft parts. In fact there exists at this level a means of access to the orbit that is most remarkable. ... and the finger may be deeply introduced in

the superior external and inferior walls of the orbit. The exploration is even rendered easy when the patient presents a marked exophthalmos which is generally the case for all the orbital tumors and very particularly in the case of tumors of the optic nerve."

I will quote to you now one of the three cases reported by Dr. Rollet, of Lyons, France, in the Transactions of the French Ophthalmological Society for the year 1907. In all of said cases the tumors were extracted through incisions of the soft parts without bone flaps. Dr. Rollet says, "Instead of making an external incision which was successful in my previous case, I preferred in my last one to make a large internal orbitotomy and I was able by this method to remove a sarcoma of the optic nerve. I divided the optic nerve anteriorly behind the eye and posteriorly as far back in the orbit as possible and I extracted this tumor 33 millimeters in length by 17 in breadth."

It is evident then by the further experience of these authors that if by the use of this incision, a ready access may be had to the optic nerve and soft parts beyond, as well as permitting of extensive digital exploration, that its range of usefulness is all that can be desired in the presence of exophthalmos. It is probable that you would not obtain the same result in the cadaver if there is no tumor, as the eye and soft parts have not been previously displaced.

#### A GENERAL CONSIDERATION OF SOME POINTS OF INTEREST IN THE DIAGNOSIS AND TREATMENT OF SYPHILIS.\*

By GEORGE D. CULVER, M. D., San Francisco.

Schaudinn and Hoffman's discovery of the spirocheta pallida, Wassermann's application of the complement fixation test to syphilitic serum, and Ehrlich's production of salvarsan are now medical history. It is history of the sort that does not lighten the physician's labor, but does make it more interesting. All these factors are the result of laboratory work, and lead more and more to depending upon laboratory methods in the diagnosis and prognosis of syphilis. Technically speaking, a record may be considered incomplete without finding the spirocheta pallida in the early lesions or without a positive Wassermann finding in either early or late lesions. But practically speaking, the majority of cases that the dermatologist sees do not require either of these for a positive diagnosis.

It is when doubt arises that finding the micro-organism or getting a positive Wassermann test is of such great aid and comfort. It is a very satisfactory solution of a doubt to find the specific spirillum in the serum expressed from a sore, either genital or extra-genital. It is not such a difficult thing to find this little corkscrew organism in many of the early lesions, such as the chancre, the roseolar rash, mucous patches or in the papules, as it is frequently present in large numbers, particularly in the serum obtained from moist condylomata. It may be found in the fresh serum with the dark field illumination, or in

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